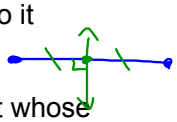
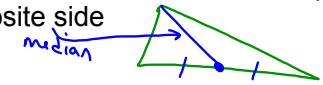
5.1 Definitions

perpendicular bisector-a line, segment, or ray that passes through the midpoint of a segment and is perpendicular to it



median (of a triangle)- segment whose endpoints are the vertex and the midpoint of the opposite side



altitude (of a triangle)-segment from a vertex to the line containing the opposite side and is perpendicular to that line

5-2 Inequalities and Triangles

Definition of Inequality-- a > b iff there is a positive number c, such that a = b + c

ex $7 = 5 + 2$

$7 > 5$

$7 > 2$ def of ineq.

Properties

Comparison

Transitive

Addition/Subtraction

Multiplication/Division

ex $-3x > 12$

$x < -4$

Ex:

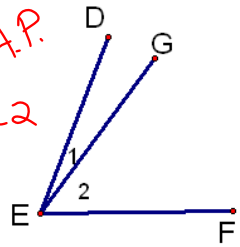
$LN = LM + MN$ S.A.P.

$LN > MN$

$LN > LM$

> def. of an inequality

Ex:



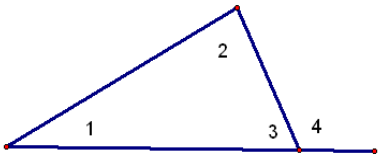
A.A.P.

$m\angle DEF = m\angle 1 + m\angle 2$

$m\angle DEF > m\angle 1$

$m\angle DEF > m\angle 2$ def. of. ineq.

Ex:

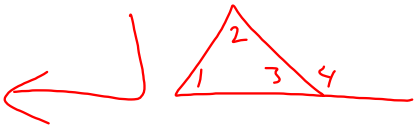


$m\angle 4 = m\angle 1 + m\angle 2$ Ext $\angle$ of $\triangle$ thm

$m\angle 4 > m\angle 1$

$m\angle 4 > m\angle 2$ } def of ineq

Thm. 5.8 Exterior Angle Inequality Theorem--The ext. angle of a triangle is greater than either of its corresponding remote interior angles

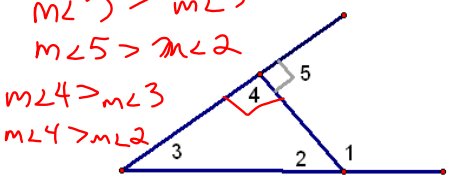


$m\angle 4 > m\angle 1$

$m\angle 4 > m\angle 2$

Which angle is the largest?

(Figure is not drawn to scale.)



$m\angle 5 > m\angle 3$

$m\angle 5 > m\angle 2$

$m\angle 4 > m\angle 3$

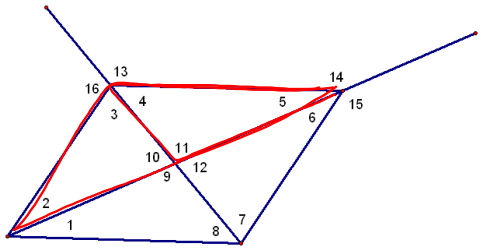
$m\angle 4 > m\angle 2$

$m\angle 1 > m\angle 4$

$m\angle 1 > m\angle 3$

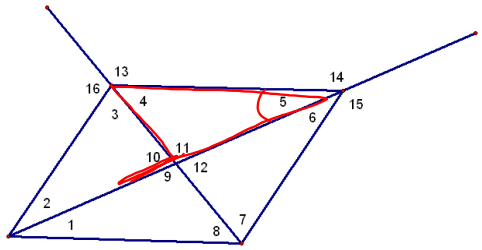
$\angle 1$

What angles measure less than angle 14? (Figure is not drawn to scale.)



∠4
∠11
∠3
∠2
∠9
∠6
∠7

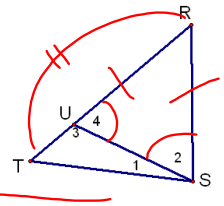
What angles measure greater than angle 5? (Figure is not drawn to scale.)



∠13
∠12
∠10
∠16
∠15

Given: $\triangle RST$
$RU = RS$
$RT > RS$

Prove: $m\angle RST > m\angle T$

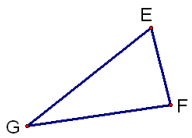


S.	R.
① ~	① Given
② ∠4 ≅ ∠2	② ∆ Thm
③ m∠RST = m∠2 + m∠	③ AAP
④ m∠RST > m∠2	④ def of ineq
⑤ m∠RST > m∠4	⑤ Subst.
⑥ m∠4 > m∠T	⑥ Ext ∠ Ineq Thm
⑦ m∠RST > m∠T	⑦ Transitive

Theorem 5.9--If one side of a triangle is longer than another side, then the angle opposite the longer side has a greater measure than the angle opposite the shorter side.

G: GE > EF

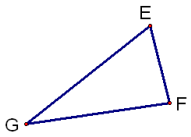
Concl: m∠F > m∠G



Theorem 5.10--If one angle of a triangle is larger than another angle, then the side opposite the larger angle has a greater measure than the side opposite the shorter angle.

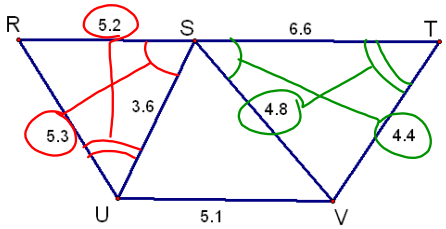
G: m∠F > m∠G

Concl: GE > EF



1. Which is greater, m∠RSU or m∠SUR?

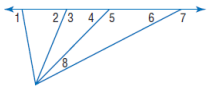
2. Which is greater, m∠TSV or m∠STV?



Hw
p252
17-35, 37-42

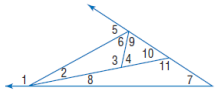
Determine which angle has the greatest measure.

17. ∠1, ∠2, ∠4
18. ∠2, ∠4, ∠6
19. ∠3, ∠5, ∠7
20. ∠1, ∠2, ∠6
21. ∠5, ∠7, ∠8
22. ∠2, ∠6, ∠8



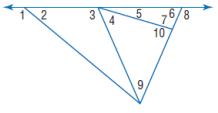
Use the Exterior Angle Inequality Theorem to list all angles that satisfy the stated condition.

23. all angles whose measures are less than $m\angle 5$
24. all angles whose measures are greater than $m\angle 6$
25. all angles whose measures are greater than $m\angle 10$



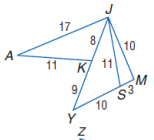
Use the Exterior Angle Inequality Theorem to list all angles that satisfy the stated condition.

26. all angles whose measures are less than $m\angle 1$
27. all angles whose measures are greater than $m\angle 9$
28. all angles whose measures are less than $m\angle 8$



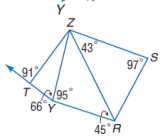
Determine the relationship between the measures of the given angles.

29. $\angle KAJ, \angle AJK$
30. $\angle MJY, \angle JYM$
31. $\angle SMJ, \angle MJS$
32. $\angle AKJ, \angle JAK$
33. $\angle MYJ, \angle JMY$
34. $\angle JSY, \angle JYS$



Determine the relationship between the lengths of the given sides.

37. $\overline{ZY}, \overline{YR}$
38. $\overline{SR}, \overline{ZS}$
39. $\overline{RZ}, \overline{SR}$
40. $\overline{ZY}, \overline{RZ}$
41. $\overline{TY}, \overline{ZY}$
42. $\overline{TY}, \overline{ZT}$



35. **Given:** $\overline{JM} \cong \overline{JL}$
$\overline{JL} \cong \overline{KL}$

Prove: $m\angle 1 > m\angle 2$